CURRENT LITERATURE

NOTES FOR STUDENTS

Oenothera genetics.—HERIBERT-NILSSON[1] discusses the data from his studies of *Oenothera Lamarckiana*, suggesting what he calls a Mendelian interpretation of the mutating tendency of this species. The character with which he worked was the red pigmentation found in the leaf nerves of some of his plants and absent in others. He concludes that the red-nerved and white-nerved plants form a distinct discontinuous variation; that the white-nerved plants are pure recessives and when selfed or intercrossed produce only white-nerved plants; that a homozygous dominant is not formed, and that therefore a strain of pure red-nerved plants cannot be produced, but all red-nerved plants when selfed or intercrossed will produce some white-nerved plants. Finding the average ratio of red-nerved to white-nerved plants in *O. Lamarckiana* and most of its "mutants" to be 2.68:1, or nearly 3:1, instead of 2:1 as would be expected when no positive homozygotes are formed, he adopts the explanation proposed by WILSON in explaining the work of CUÉNOT with yellow mice. According to this explanation, most of those positive female gametes which would normally be fertilized by positive male gametes, but which for some reason cannot be so fertilized, are fertilized by recessive male gametes. This would produce an average ratio of the red-nerved to white-nerved plants a little lower than would be the case under normal genetic behavior, thus accounting for a ratio of 2.68:1 instead of 3:1. It should not be forgotten, however, that the work of CASTLE removed the necessity for this interpretation in the case of yellow mice, and thus lessened its value as an interpretation of this sort of deviation from expected ratios.

In "*gigantea*" (the *gigas* type) the author interprets the observed ratios as modifications of 3:1, 15:1, 63:1, and 255:1, and concludes that in this type the red-nervedness is probably produced by any one of four factors. He also finds that the factor or factors for red leaf nerves affects other morphological and physiological characters of the plant.

Having thus striven for a Mendelian interpretation of the behavior of red vs. white nerves, the author presents his observations on the mutation ratios of *O. Lamarckiana* and its mutants, or, as he calls them, "Kombinante," and suggests the following explanation of the mutating tendency of this species. *O. Lamarckiana* is dependent upon a number of groups of multiple factors, the majority of which cannot be produced in a homozygous dominant condition,

[1] HERIBERT-NILSSON, N., Die Spaltungserscheinungen der *Oenothera Lamarckiana*. Lunds Univ. Årsskrift 12:4–131. 1915.

and the various mutants are plants which result when one or more of these groups are in a homozygous recessive condition. This might be represented graphically thus: *O. Lamarckiana* = *Aa Aa Aa aa; Bb Bb bb bb; Cc Cc cc cc,* etc., where in every group at least one of the factors would be present in the positive condition. A mutant = *aa aa aa aa; Bb Bb bb bb; Cc Cc cc cc,* etc., where in at least one of the groups none of the factors are present in the positive condition. This interpretation is thought to explain the occurrence of different ratios of mutation, for if there were 4 such independent multiple factors for the *Lamarckiana* character, a given mutant dependent upon the absence of all these positive factors would occur in the following percentage: 1.2 per cent when all of the 4 factors are heterozygous; 3.7 per cent when only 3 of the 4 factors are heterozygous; 11.1 per cent when only 2 of the 4 factors are heterozygous; 33.3 per cent when only 1 of the 4 factors is heterozygous.

At several points in his paper the author points out that since different strains of *O. Lamarckiana* yield different series of mutants it cannot be an elementary species, as DEVRIES claims, but must be a group of elementary species, the free intercrossing of which makes possible the production of the mutants by ordinary Mendelian segregations. The assumption of extensive linkage of characters, of the occurrence of heterogamy (that is, the transmission of hereditary characters through the sperms differing from those possessed by the eggs of the same individual), and the assumption that one sort of sperm may hinder the activities of another sort of sperm, are not in strict accord with the author's claim that he has given a Mendelian interpretation of *Oenothera* genetics.—BEN C. HELMICK.

Mutation in Matthiola annua, a "Mendelizing" species.—In a preliminary paper under the foregoing title FROST[2] has published certain conclusions in regard to the origin of Mendelian dominants which are sure to arouse no little interest. Until the full account appears it will be impossible to judge of the validity of FROST's interpretation of his discoveries, but the discoveries themselves are obviously of prime importance, interpret them however we may. According to his own view, he has observed the origin by mutation of 8 different dominant Mendelian varieties from a single strain of stocks. To show that this would be a discovery of the highest theoretical significance, it is only needful to point out that similar evidence is extremely meager, and in practically every case not as well attested as one might wish. The list of new dominants which have arisen by mutation is practically exhausted when we have mentioned KEEBLE's giant *Primula* and COLLINS' albinistic maize, for the case of GATES' *Oenothera rubricalyx* is still in dispute.

FROST states that the individual mutations of his *Matthiola* cultures obviously are not extracted recessives, but heterozygous dominants; that they seem to be due to definite changes in the germ plasm distinct from the recombi-

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[2] FROST, HOWARD B., Mutation in *Matthiola annua*, a "Mendelizing" species. Amer. Jour. Bot. 3:377–383. 1916.